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**IN THE UNITED STATES DISTRICT COURT**

**DISTRICT OF HAWAII**

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| LUIS SANCHO, et al., | Civil No. CV08-00136 HG |
| Plaintiffs, | **AFFIDAVIT OF WALTER L. WAGNER IN REBUTTAL TO LATE-FILED AFFIDAVIT OF BRUCE STRAUSS DATED AUGUST 29, 2008; Exhibits "A-G"** |
| vs. | |
| US DEPARTMENT OF ENERGY, et al., | |
| Defendants. | Date: Sept. 2, 2008<br>Time: 10:00 A.M.<br>Court: Hon. Helen Gillmor |

AFFIDAVIT OF WALTER L. WAGNER IN REBUTTAL TO LATE-FILED AFFIDAVIT OF BRUCE STRAUSS DATED AUGUST 29, 2008

I, Walter L. Wagner, after first being duly sworn, affirm, state and declare under penalty of perjury of the laws of the State of Hawaii as follows:

1. I recall and repeat all of my prior affidavits.

2. I have read the late-filed Declaration of Bruce Strauss that was filed on Friday, August 29, 2008.

3. Declarant Bruce Strauss in his declaration initially raises questions concerning my discovery of evidence for detection of a moving magnetic monopole, which I will fully answer to his satisfaction, and to the Court's satisfaction, in subsequent paragraphs. He also makes false assertions regarding strangelet searches and strangelet safety, which is the subject of this hearing, which false assertions I will address initially. His false assertions regarding my other statements in my prior affidavit will also be addressed.

4. In paragraph 23 and elsewhere in his declaration, declarant Strauss questions[1] whether strangelet searches are even planned at the LHC, a fact he should be well aware of in his position with defendant DOE. Attached

[1] Paragraph 23 of his Declaration reads: "*In Paragraph 29 of his declaration, Mr. [sic] Wagner states 'there are in fact active searches for strangelets planned at the LHC as shown by numerous articles I've read by the scientists engaged in the detector designs for strangelet detection.' Mr. [sic] Wagner fails to cite the 'numerous articles' he has read on the subject.*" Some of those numerous articles are now attached as Exhibits "A-D"

herewith as Exhibit "A" is a somewhat scholarly article from Wikipedia on the subject of "strangelets". This article is also a good introductory tutorial as to the nature of *strange matter*.

5. In that article, under the topic of *Accelerator Production*, it reads:

> "It is believed that the higher energy of the lead-lead collisions of the Large Hadron Collider (LHC), compared to the RHIC, will produce more strange quarks in the quark-gluon plasma (QGP) than are produced at RHIC's QGP. This higher production of strange quarks might allow for production of a strangelet at the LHC, and searches are planned for such upon commencement of collisions at the LHC ALICE detector."

It should be noted that the Wikipedia article also makes reference to the search for strangelets via the AMS-2 satellite schedule for launch in 2009. That is but one article I have read regarding the LHC strangelet searches.

6. Attached herewith as Exhibit "B" is an abstract of an article from Journal of Physics G: Nuclear and Particle Physics, published more than a decade ago [1997] regarding a proposal for strangelet searches at the LHC's ALICE detector. The article is entitled "*CASTOR: A dedicated detector for the detection of centauros and strangelets at the LHC*". Its abstract reads in its opening sentence as follows: "We present a specialized detector system, CASTOR, which, as an integral part of the ALICE experiment, will search for

centauros and strangelets in central Pb+Pb [Lead-Lead] collisions at the LHC." [underlining added for emphasis; bracketed insert added for clarity]

7. Attached herewith as Exhibit "C" is a third scientific article abstract regarding proposed strangelet searches at the LHC. The article was posted on arXiv and is identified as a high energy physics article at arXiv:hep-ph/9908210 [1999], entitled: "Formation of Centauros and Strangelets in Nucleus-Nucleus Collisions at the LHC and their Identification by the ALICE Experiment". The abstract reads as follows:

> "Abstract: We present a phenomenological model which describes the formation of a Centauro fireball in nucleus-nucleus interactions in the upper atmosphere and at the LHC, and its decay to non-strange baryons and Strangelets. We describe the CASTOR detector for the ALICE experiment at the LHC. CASTOR will probe, in an event-by-event mode, the very forward, baryon-rich phase space 5.6<\eta<7.2 in 5.5 A TeV central Pb+Pb [Lead+Lead] collisions. We present results of simulations for the response of the CASTOR calorimeter, and in particular to the traversal of Strangelets." [underlining added for emphasis, bracketed insert added for clarity.]

8. Attached herewith as Exhibit "D" is an abstract of a fourth science article regarding proposed strangelet searches at the LHC. This is taken from the physics journal Physics of Atomic Nuclei [2004], Volume 67, Number 2, February, 2004, in the category of *Elementary Particles and Fields*. The article is entitled "*Model for describing the production of*

*Centauro events and strangelets in heavy-ion collisions.*" It's abstract reads in pertinent part as follows:

> "... A Centauro fireball decays predominantly into nucleons, strange hyperons, and possibly strangelets. Centauro events in Pb+Pb [Lead+Lead] collisions at the LHC energy are simulated for the CASTOR detector. The signatures of these events are discussed in detail." [underlining added for emphasis, bracketed insert added for clarity.]

9. I have read numerous other science articles on proposed strangelet searches at the LHC, but time restraints and space restraints preclude me from listing all of them here. I have not read of any cancellations of plans to search for strangelets at the LHC as a result of any of the experiments performed at the much lower energy RHIC where strangelets have not been detected, nor would one expect to, as strangelet theory is robust and shows that strangelets could form at the LHC when they could not form at the RHIC. Indeed, some theory suggests, as shown in the Wikipedia article, and contrary to the opinion of declarant Strauss, that the higher the energy of the collision, the more likely it is to produce strangelets.

10. While declarant Strauss repeats almost *ad nauseum* his opinion that strangelet production is not possible[2], but if possible, it would be safe, his opinion is highly biased by his desire to justify his prior decisions to fund the LHC, and is not supported by emerging robust theories of strangelet theory and how they might prove deadly. The RHIC experimentation has neither proven nor disproven strangelet theory, and is open to wide interpretation.

11. It is clear that declarant Strauss is not an authority on strangelet theory, and does not keep abreast of the numerous proposals to search for strangelets at the ALICE detector at the LHC, via the AMS-2 detector to be launched in 2009, and so forth. I have read extensively on the topic since long before my filing [in 1999] of an initial suit to preclude operation of the RHIC, for fear that it might create strangelets. Fortunately that fear did not materialize. I have continued to remain abreast of the field, and am impressed with articles such as the ones referenced by co-plaintiff Sancho

[2] Page 16, paragraph 22 "*if the hypothesized strangelets exist in nature, in all likelihood they would have already been produced at RHIC or at other similar facilities that have operated since the 1980s*"; Page 17, paragraph 25 "*In addition, strangelets would have already been produced at RHIC or at previous facilities. ... These are all deductions based on solid empirical observations and sound scientific theory. ... if any of these hypothetical particles were to exist, the remote possibility of their production at the LHC would be entirely safe. This conclusion is based on numerous studies based on solid empirical evidence and well-established scientific principles.*" [N.B. No evidence is provided for any of his conclusory opinion, which is contrary to the established studies showing the likelihood that strangelets could be produced at the LHC.

[who also reads extensively on strangelet theory] which show that negative strangelets are feasible, and indeed likely.

12. This Court should not be deceived by the false assertions of declarant Strauss. Strangelet searches are planned for the LHC and via the AMS-2 because many people believe they exist, or if they don't exist in nature, they can be created. However, those who have proposed creating them have been naïve regarding their properties, disregarding the warning signs only now being confirmed by additional theory such as referenced by Dr. Sancho in his affidavit in which he attached a science article regarding the fact that strangelets might even be negative.

13. To give this honorable Court an example of how scientific theory, even in well-entrenched areas such as nuclear decay theory, can have a sudden change, I attach herewith as Exhibit "E" a very recent [August 25, 2008] article showing a completely unexpected and anomalous effect in which well-established theory has been radically challenged. Such well-established theory shows that nuclear decay rates, which take place in the interior of the nucleus of atoms, are unaffected by physical or chemical processes. However, the attached article shows that that is not true. Instead, the distance between the Earth and the Sun [which varies on an annual basis

because the orbit is slightly elliptical] affects that rate by an entirely unknown process. The authors have several suggestions as to theories that could be tested, but to-date, there is no explanation for these anomalous results which demolish the well-entrenched idea that nuclear decay rates do not change[3] based on the environment in which the nuclei are located.

14. Declarant Strauss also makes numerous *ad hominem* attacks against myself which are untrue and unjustified. I will not rebut those in detail, but note the following:

- My competency is not only in high energy physics, which is derived from my work in high energy cosmic radiation physics from more than three decades ago, but also from my work in nuclear medicine, a demanding field of which Declarant Strauss has little or no knowledge;
- I am well aware of the difference between LHC Construction, and LHC Research. The fact that the DOE has completed its funding of the LHC construction is irrelevant to the fact that the DOE is

[3] One minor exception exists in which it has long been known that for Electron-Capture [EC] decays, the electron cloud from which electrons are captured varies with the chemical bonding, and that variance can slightly vary the EC decay rate.

planning to engage in funding in 2009 for LHC Research at the two LHC detectors partly owned by the DOE.

- I am well aware that the U.S. party is not a "member" of the CERN alliance, but rather an "observer". I am also aware that the U.S. Party contributed a greater share [roughly 10%] towards its construction than the individual member states. I am also aware that the U.S. party has the right to participate in all major decisions of the CERN alliance, as per the contractual Agreement between CERN and the U.S. party. If declarant Strauss and others decided to abdicate that contractual authority, that was their decision and contrary to the spirit and letter of the Agreement.
- I am well aware that the LSAG Report does not reference me specifically. Rather, the LSAG Report and its preliminary report prepared by Michelangelo Mangano, and other communications between CERN and myself, all show that the prior cosmic-ray argument utilized for safety by prior studies was fallacious, and a new safety study was mandated. That new 'argument' is now also attacked as inconclusive by the paper prepared by R. Plaga, an expert in cosmic radiation physics.

15. In light of the fact that declarant Strauss was also engaged in fruitless searches for evidence of magnetic monopoles during the same era that I was engaged in high-energy cosmic radiation experiments at UC Berkeley that produced such evidence, he is apparently rankled that my work was successful, while his was not. Accordingly, he seems to question my involvement in that discovery, which I will detail briefly here, and more fully in the Attachment "F", which is a copy of the original 1975 Physical Review Letters article from my personal file cabinet that I have maintained for the past 33 years, and not obtained from the internet as is declarant Strauss' copy attached to his late-filed declaration.

16. Appended to that article is my more detailed explanation showing that the discovery was by myself, though the write-up was submitted by Buford Price, and the reasons for that curious fact. That experiment analysis was almost entirely mine, save for the Cerenkov data which was obtained after I had announced I had found evidence for a magnetic monopole.

17. At the time I was performing the experimental analysis, I was doing so unaided by other parties, save for Dr. Shirk who ran my data through a computer program that had been earlier developed for such purposes. No one expected anything of significance from that experiment. When the data

from that experiment was run through the computer program by Dr. Shirk, he did not bother to look at the results. Instead, they were handed to me [as was our custom], and I began perusing the data to see if anything of interest had passed through the detectors. In reviewing the computer print-out of the data I had collected, I came across the magnetic monopole event, which was exceptionally conspicuous and anomalous. It stuck out like a sore thumb.

18. After about 2-3 minutes of pondering that particular event's data, I suggested to Dr. Shirk, who was sitting next to me at the time, that a magnetic monopole had traversed the detectors. I showed him the data, and he agreed, and the two of us then presented the data to Buford Price, who also agreed. At no time have I ever retracted that conclusion. The explanation for why my data and my analysis and my announcement was reported as being authored by others is included in the Attachment "F".

19. While other parties have attempted to denigrate that result, thus far, no valid alternative explanation has been presented that would account for that data, other than a magnetic monopole. The suggestion by Luis Alvarez that a doubly-fractionating normal nucleus could account for the data, if one assumed that there were exceptionally wide error-bars, neglects the fact that one would thus expect to have seen many other doubly-fractionating normal

nuclei that came close to, but did not exactly mimic a magnetic monopole. That 'explanation' by Luis Alvarez is extremely implausible, as one would expect to have seen billions of other doubly-fractionating nuclei first, without the first one ever seen just happening to exactly mimic a magnetic monopole because its error bars were exceptionally wide.

20. The arguments repeated by declarant Strauss regarding micro black hole production being assured as being safe has been refuted by the paper by Dr. R. Plaga, attached to my previous affidavit. Declarant Strauss is silent thereon because that paper absolutely refutes the conclusions of the LSAG Report with respect to micro black hole production by the LHC.

21. To give this Court awareness that high-energy nuclear physics experiments do not always produce the expected results, I attach hereto Exhibit "G", which is a Wikipedia article regarding the *Castle Bravo* experiment. In that experiment, funded by defendant's predecessor agency AEC, the actual energy yield was approximately two and a half times what was expected, yielding 15 megatons[4] equivalent of energy. This excess energy yield was as a result of overlooking a fact of physics which resulted in far more neutrons being produced than anticipated, resulting in far more

[4] One megaton equivalent is one million tons of TNT chemical explosive.

fission of the U-238 tamper, and far more radioactive fallout, as detailed in the *Cause of High Yield* section of the article. Clearly, high-energy physicists are not immune from overlooking relevant facts, even when right in front of them. Such is the case herein, in which physicists, having built a machine, now wish to test it even if theory now shows a risk of planetary destruction.

21. Accordingly, it is respectfully requested that this honorable Court recognize that a legitimate scientific dispute exists regarding the safety of the LHC, and that the NEPA requirements for hearings thereon are applicable.

22. Further, your affiant sayeth naught.

Dated: August 30, 2008

Walter L. Wagner